



EXAMINING THE IMPACTS OF ENVIRONMENTAL CHARACTERISTICS ON SHARIAH-BASED BANK'S CAPITAL HOLDINGS: ROLE OF COUNTRY RISK AND GOVERNANCE QUALITY

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ABSTRACT

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This study investigates the effects of environmental characteristics, namely the quality of country-level governance and domestic risk on Islamic banking capital decisions. To do so, this study selects 29 listed Islamic banks operating in Arab markets for the wide range between the 2003-2018 period by performing the System-GMM dynamic panel technique. The results underscore that higher country-level governance quality is linked with higher capital ratios and Islamic banks increase capital ratios specifically by improving methods of anti-corruption, political stability, government effectiveness, and legal systems. Moreover, the results reveal that Islamic banks increase capital ratios by the rise of a country's vulnerability, particularly by increasing financial and economic risks. However, the results suggest that decreasing political risk also corresponds with higher capital ratios. Overall, the results confirm that environmental characteristics have a pivotal role in determining Islamic bank capital ratios. The results are robust and the findings of this study are likely to open new discussions in the banking literature.

Contribution/Originality: This study specifically contributes by examining the effect of environmental characteristics, namely country risk and governance quality on capital decisions of Islamic banks operating in Arab markets.

1. INTRODUCTION

Bank capital is considered the most significant factor in the performance of the banking sector, given the fact that it represents the strength of banks against risk (Kalifa & Bektaş, 2018). The works of Berger and Herring (1995) and Francis and Osborne (2010) argued that banks hold minimum amounts of capital since it acts as a buffer to absorb unexpected losses or unforeseen fluctuations in order to prevent any possible bank failure. Remarkably, since the sub-prime mortgage crisis in 2007 and 2008, bank capital has become a popular subject for regulatory bodies (e.g., Basel Committee on Banking Supervision) and has considerably triggered the interest of many researchers. For instance, the work of Barrios and Blanco (2003) showed that market discipline is the crucial factor that impacts capital ratios. Ariff (2008) suggested that profitability and size impact a bank's capital ratio positively and negatively, respectively. Octavia and Brown (2010) found that macroeconomic factors significantly impact bank capital structures, particularly in emerging countries. Cohen and Scatigna (2016) and Valencia (2016) showed that banks' capital ratios increased

gradually after the financial crisis¹ and higher uncertainty causes banks to keep the higher capital ratios to reduce the riskiness of their portfolios. Recently, a study by Anginer, Demirguc-Kunt, Huizinga, and Ma (2016) revealed that corporate governance plays a significant role in determining bank capital decisions. Bitar, Hassan, and Hippler (2018) also showed that improvements in the financial and economic environments and market discipline is linked with higher bank capitalization. Few studies have focused, however, on investigating the determinants of shariah-principles banks' capital ratios (e.g., (Bitar et al., 2018; Chazi & Syed, 2010; Kalifa & Bektaş, 2018)). The Islamic financial industry has significantly grown in the last three decades, with a 15–20% annual growth rate in both Muslim and non-Muslim countries (Smolo & Hassan, 2010), and is expected to reach \$6.5 trillion by 2020 (Mollah, Hassan, Al Farooque, & Mobarek, 2017). As approved by the Organization of Islamic Conference (OIC), Islamic banks are defined as a “financial institution whose status, rules and procedures expressly state its commitment to the principle of Islamic sharia and the abolishing of the receipt and payment of interest on any of its operations” (Ali & Sarkar, 1995). Farook, Kabir, and Lanis (2011) described Islamic banks as a financial intermediary that works under the controls of Islamic laws and shariah principles.

Islamic banks are a particular type of financial institution that operate differently and have unique micro-operating fundamentals by employing sharia principles and Islamic laws. Unlike the conventional banks' interest-bearing modes, Islamic banks base investment and financing decisions on profit and loss sharing (PLS) and return-bearing contracts. Also, Islamic banks offer investment accounts based on partnership-basis contracts (e.g., *Mudarabah*) for whom investment depositors are considered quasi-equity holders. Islamic banks also develop different capital ratio guidelines concerning their nature and characteristics. Over time, regulatory organizations such as Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI) and the Islamic Financial Services Board (IFSB) have proposed different capital adequacy frameworks to increase the credibility and soundness of the Islamic financial system worldwide.

By considering the unique characteristics of Islamic banks and the significant gap in research in the related literature, this study aims to answer the following questions:

- What are the main determinants of capital ratios in the shariah-based banks?
- How do the environmental characteristics impact Islamic bank capital decisions across countries?

To do so, 29 listed Islamic banks operating in Arab markets were selected for the wide range between the 2003–2018 period. This study sheds light on the following gaps by investigating the impact of bank-level variables (size, profitability, financial risk, credit risk, and default risk) on capital ratios. For testing the effect of environmental characteristics, this study considers the effect of country-level governance quality and its dimensions, namely corruption, government effectiveness, political stability, regulatory quality, rule of law, voice and accountability, and also domestic risk and its sub-indices, mainly financial, economic, and political risks. The findings of this study are likely to open new discussions in the banking literature.

The article is organized as follows. Section 2 describes data and methodology. Section 3 explains the results and discussions. Section 4 concludes the article.

2. DATA AND METHODOLOGY

2.1. Data and Descriptive Statistics

This study initially focuses on listed banks operating in Morgan Stanley Capital International (MSCI) Arabian Market Index countries (Saudi Arabia, Bahrain, Qatar, Kuwait, United Arab Emirates, Egypt, Jordan, Morocco,

¹For instance, the capital adequacy for larger banks increased from 5.7% in 2009 to 9.2% in 2012 while for smaller banks increased from 7.8% to 9.4% over the same period. Also, the capital ratios for US commercial banks increased from 11.3% in 2009 to 11.8% in 2012 (www.federalreserve.gov/releases/h8/current/default.htm).

Tunisia, and Lebanon). However, the countries of Morocco, Tunisia, and Lebanon are excluded as they do not offer Islamic banking systems, leaving the final sample list limits at 29 listed Islamic banks between the 2003- 2018 period.

Some studies revealed that bank-specific variables such as size, profitability, and risk (e.g., financial, credit) impact capital ratios significantly (e.g., (Anginer et al., 2016; Bitar & Tarazi, 2019; Mahdi & Abbes, 2018)). This study selected similar financial factors, and the annual data was collected from the Bankscope and the respective banks' websites.

The findings of previous studies showed that the traditional macroeconomic determinants (e.g., inflation, GDP, exchange rate) and institutional development determinants (e.g., rule of law, regulatory efficiency, financial development) impact bank capital decisions (e.g., (Bitar et al., 2018; Bitar & Tarazi, 2019; Kalifa & Bektaş, 2018; Mili, Sahut, Trimeche, & Teulon, 2017)). Following the work of Athari, Shaeri, Kirikkaleli, Ertugrul, and Ozun (2020), this study employs the novel country-risk composite index scores² from Political Risk Services Group³, which include a set of 22 components that are grouped into three subcategories of financial, economic, and political risks. Likewise, this study uses the proxy of country-level governance index scores from the Worldwide Governance Indicators (WGI), as has previously been used by Bitar and Tarazi (2019), for measuring country-level governance. The WGI constructs a country-level governance index by using the aggregate six dimensions, including control of corruption, government effectiveness, political stability and absence of violence (terrorism), regulatory quality, rule of law, and voice and accountability.

Table 1 reports the country-specific descriptive summary of the investigated variables. As shown in panel (A), Egypt displays the lowest capital adequacy and equity to asset ratios with a mean of 0.173 and 0.096. In contrast, Jordan had the highest capital adequacy with a mean of 0.376, and Saudi Arabia had the highest equity to asset ratio with a mean of 0.488. Egypt, with a mean of 0.909 and 1.908 has the highest financial and default⁴ risks. Panel (B) also shows the average country-level governance and its dimensions scores. As shown, Egypt and Saudi Arabia, with a mean of -0.705 and -0.337, have the lowest country-level governance scores. However, the United Arab Emirates and Qatar have the highest scores with a mean of 0.544 and 0.492, respectively. Moreover, panel (C) shows the average domestic risk and sub-indices scores and indicates that the United Arab Emirates and Kuwait, with a mean score of 81.803 and 81.181, have the least vulnerable environments, respectively.

Figure 1 demonstrates the domestic risk and the country-specific sub-indices scores for the examined period of 2003-2018. As shown in Figure 1, Egypt has the least stable environment relative to other countries. Overall, Figure 1 shows that domestic risk has a negative trend, and countries experienced domestic instability between 2003-2018.

² The domestic risk score is between the 0-100 range and a high score means low country risk.

³ <http://www.prsgroup.com>

⁴ A higher Z-score means a lower probability of default risk.

Table 1. Descriptive summary (2003-2018).

Panel (A): Average bank-specific variables								
Sample country	Sample listed	Capital adequacy	Size	Profitability	Financial risk	Credit risk	Default risk	Equity to assets
Saudi Arabia	5	0.221	24.435	0.028	0.512	0.535	1.565	0.488
Bahrain	6	0.242	20.462	0.022	0.593	0.455	1.392	0.406
Qatar	3	0.203	23.664	0.034	0.813	0.657	1.636	0.183
Kuwait	6	0.195	21.163	0.012	0.827	0.551	1.661	0.167
United Arab Emirates	4	0.212	22.958	0.019	0.769	0.512	1.618	0.288
Egypt	3	0.173	22.773	0.013	0.909	0.488	1.908	0.096
Jordan	2	0.374	20.018	0.025	0.728	0.346	1.611	0.255
Panel (B): Average country-level governance and its dimensions scores								
Sample country	Corruption	Government effectiveness	Political stability	Regulatory quality	Rule of law	Voice and accountability	Governance score	
Saudi Arabia	-0.009	-0.029	-0.416	0.060	0.106	-1.735	-0.337	
Bahrain	0.207	0.440	-0.542	0.663	0.464	-1.058	0.029	
Qatar	0.919	0.726	1.033	0.514	0.722	-0.960	0.492	
Kuwait	0.143	0.027	0.241	0.124	0.387	-0.554	0.061	
United Arab Emirates	1.061	1.076	0.818	0.726	0.536	-0.951	0.544	
Egypt	-0.639	-0.540	-1.073	-0.532	-0.324	-1.125	-0.705	
Jordan	0.201	0.120	-0.419	0.192	0.330	-0.713	-0.048	
Total	0.269	0.260	-0.051	0.249	0.317	-1.014	0.005	
Panel (C): Average domestic risk and sub-indices scores								
Sample country	Financial risk Index		Economic risk Index		Political risk Index		Domestic risk Index	
Saudi Arabia	46.083		41.964		67.307		77.677	
Bahrain	40.539		40.565		68.909		75.006	
Qatar	39.396		46.349		72.534		79.139	
Kuwait	45.513		45.018		71.831		81.181	
United Arab Emirates	41.075		44.807		77.724		81.803	
Egypt	39.120		31.047		55.552		62.859	
Jordan	39.203		32.794		66.305		69.151	
Total	41.561		40.363		68.594		75.260	

Note: Table 1 shows the country-specific descriptive summary of the investigated variables.

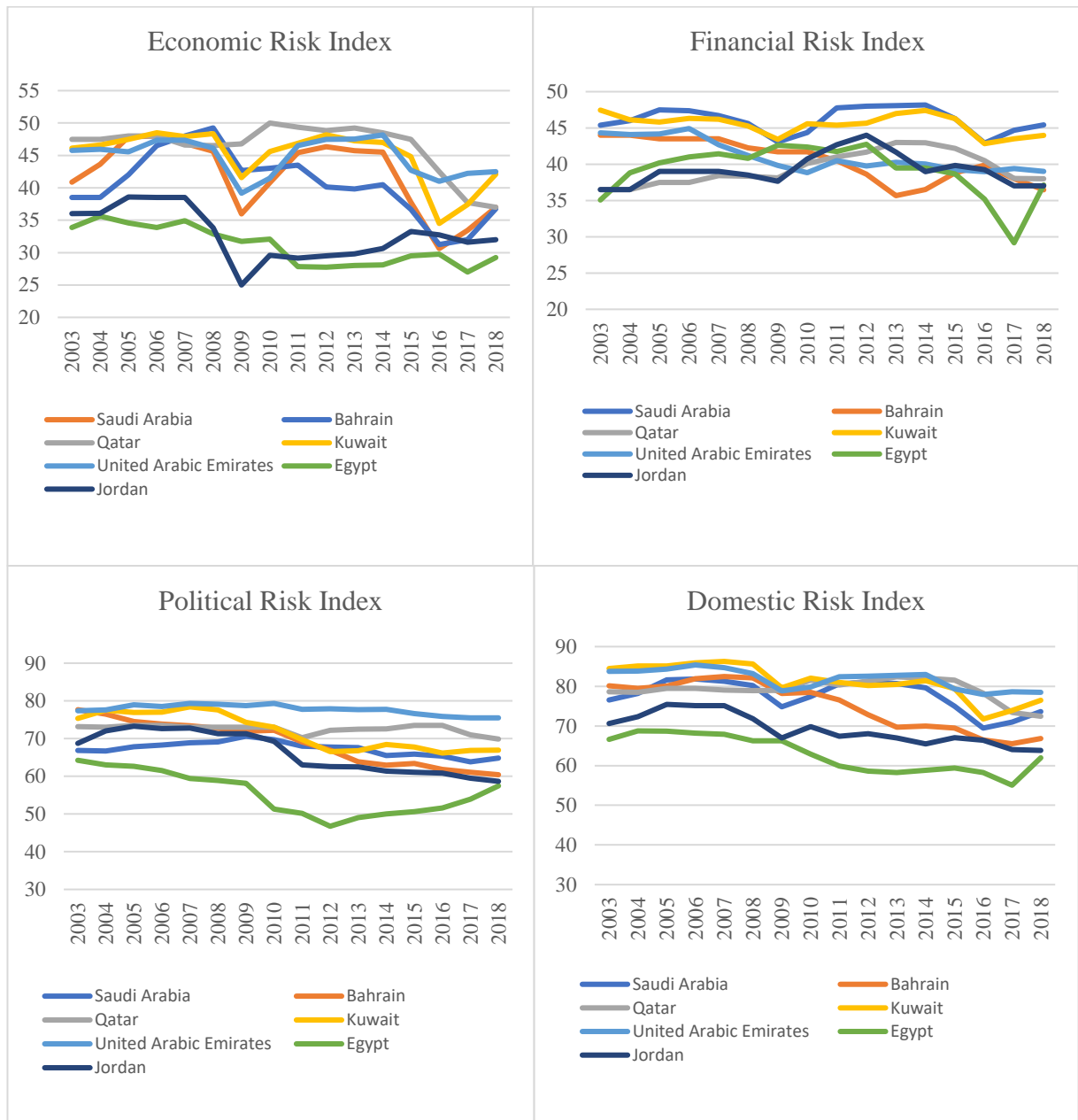


Figure 1. Time series plot of domestic risk index and its sub-indices for investigated countries.

Table 2 shows the pooled statistics (Panel (A)) and Pearson correlation matrix and Variance Inflation Factors (VIF) (Panel (B)) for the studied variables. Panel (A) shows that the median value of capital adequacy and equity to assets ratios are 0.196 and 0.142, respectively. Panel (B) further indicates that multicollinearity is unlikely to be a severe problem in the panel estimations.

2.2. Model Specifications and Methodology

Following the studies by Bitar et al. (2018) and Kalifa and Bektaş (2018) this study uses two proxies of capital adequacy (Tier 1 plus Tier 2 capital, divided by risk-weighted assets) and equity-to-assets for measuring bank capital ratio. Equations.1 and 2 are performed in order to investigate the effects of bank-specific, domestic risk, and country-level governance on Islamic banks' capital ratios.

Table 2. Pool descriptive statistics and Pearson correlation.

Panel (A): Pool descriptive statistics								
Variables	Observations	Mean	Median	Std. Dev.	Minimum	Maximum		
Capital adequacy	464	0.233	0.196	0.142	0.051	0.913		
Size	464	22.187	21.282	1.736	17.052	25.221		
Profitability	464	0.024	0.031	0.033	-0.197	0.177		
Financial risk	464	0.727	0.741	0.697	-10.122	0.873		
Credit risk	464	0.521	0.573	0.310	0.131	0.945		
Default risk	464	1.592	1.577	0.652	-0.695	3.780		
Equity to assets	464	0.179	0.142	0.117	0.031	0.615		
Panel (B): Pearson correlation matrix								
Explanatory variables	Size	PROF	FRISK	CRISK	DFRISK	DCRISK	CG	VIF
Size	1.000							1.30
Profitability (PROF)	0.257*	1.000						1.18
Financial risk (FRISK)	0.306*	0.163*	1.000					1.37
Credit risk (CRISK)	0.157*	0.256*	0.103***	1.000				1.12
Default risk (DFRISK)	0.161*	0.007	0.104	0.043	1.000			1.04
Domestic risk (DCRISK)	0.039	0.194*	0.151*	0.137**	-0.089	1.000		1.28
Governance score (CG)	-0.134**	-0.124**	-0.045	0.067	-1.101	0.347*	1.000	1.14

Note: ***, **, and * are statistically significant at 1%, 5%, and 10%, respectively.

$$CADQ_{it} = \alpha_0 + \alpha_1 CADQ_{i,t-1} + \alpha_2 \sum Bank_specific_{it} + \alpha_3 Domestic\ risk_t + \alpha_4 Country_level\ Governance_t + \vartheta_t + \varepsilon_{it} \tag{1}$$

$$ETA_{it} = \alpha_0 + \alpha_1 ETA_{i,t-1} + \alpha_2 \sum Bank_specific_{it} + \alpha_3 Domestic\ risk_t + \alpha_4 Country_level\ Governance_t + \vartheta_t + \varepsilon_{it} \tag{2}$$

Where it represents bank and time, respectively, CADQ is capital adequacy ratio; $CADQ_{i,t-1}$ is the one period-lagged CADR; ETA is equity-to-assets ratio; $\sum Bank_specific_{it}$ includes size (natural logarithm of total assets), profitability (net income-to-total assets ratio), financial risk (total liabilities-to-total assets ratio), credit risk (total markup-based and profit-loss sharing financing to the ratio of the total assets), and default risk (natural logarithm of the ratio between a bank’s ROA) plus shareholder’s equity-to-total assets ratio over the standard deviation of the ROA). ϑ_t is the country-specific effect, and ε_{it} is an independent error term.

Before estimating the equations, the panel data are winsorized at the 1% level for each year to remove the impact of outliers on the estimation. Use of Ordinary Least Squares (OLS) was avoided as the estimation models suffer from the correlation between the lagged dependent variable and error term, thereby yielding inconsistent and biased coefficient estimates (Baltagi, 2005; Roodman, 2009). Instead, dynamic panel regression provided more consistent and unbiased results in the presence of endogeneity problems and unobserved country fixed effects.

As such, this study used the generalized method of moments (GMM) approach to estimate the equations since the number of cross-sections (i=29) was higher than the number of time units (t=16) in the present study. Specifically, this study used the System-GMM (Arellano & Bover, 1995; Blundell & Bond, 1998) methodology to estimate equations because the System-GMM estimator contains both the levels and the first difference equations and outperforms the Difference-GMM methodology proposed by Arellano and Bover (1995). Therefore, to perform System-GMM estimations, this study applied the xtabond2 package, as suggested by Roodman (2009), and was executed in Stata Software. In testing the validity of the estimated models and robustness of results, the Hansen and serial correlation diagnostic tests are conducted.

Table 3. The impact of banks-specific risks, domestic risk, and governance on Islamic banks’ capital ratios.

Independent variables	Model 1: Capital adequacy ratio			Model 2: Total equity to assets		
	Coefficient	Z-value	P-value	Coefficient	Z-value	P-value
Lag capital adequacy	0.833*	3.74	0.000	---	---	---
Lag equity to assets	---	---	---	0.153*	3.82	0.000
<i>Bank-specific variables</i>						
Size	-0.065***	-1.67	0.086	-0.015*	-2.77	0.001
Profitability	0.107*	2.67	0.001	0.023***	1.67	0.077
Financial risk	1.316*	2.86	0.004	0.155*	2.94	0.000
Credit risk	0.234**	2.07	0.033	0.039*	6.40	0.000
Default risk	-1.180*	-3.38	0.001	-0.114*	-2.73	0.003
<i>Country variables</i>						
Domestic risk	-0.066**	-2.04	0.036	-0.077*	-5.53	0.000
Governance score	1.682**	2.07	0.038	0.089**	2.04	0.025
Constant	-0.534	-0.20	0.985	0.628	1.50	0.134
Diagnostic checking	P-value			P-value		
AR(2)	0.472			0.423		
Hansen test	0.431			0.502		

Note: ***, **, and * are statistically significant at 1%, 5%, and 10%, respectively.

3. EMPIRICAL RESULTS

The estimated results in Table 3 reveal that the lagged coefficient of CA and ETA is positive and significant, implying that Islamic banks follow a partial adjustment towards the target capital ratios. Size is also shown to impact capital ratios negatively, which supports the trade-off theory and is consistent with the prior studies (e.g., (Bitar et

al., 2018; Bitar & Tarazi, 2019; Gropp & Heider, 2010; Kalifa & Bektaş, 2018)), and implies that larger Islamic banks hold lower capital ratios as they have asset portfolios that are relatively better diversified, less volatile earnings, and better access to capital markets. These results are in line with the pecking-order theory as well as prior studies (e.g., (Anginer et al., 2016; Bitar & Tarazi, 2019; Brewer Iii, Kaufman, & Wall, 2008)) and reveal that profitability impacts capital ratios positively, though this contradicts with several other studies (e.g., (Ahmad, Ariff, & Skully, 2008; Yu, 2000)).

Furthermore, results show that higher bank-specific risks correspond with higher capital ratios. This is consistent with prior studies (e.g., (Ahmad et al., 2008; Kalifa & Bektaş, 2018; Mili et al., 2017)) and showed that higher leverage and loan ratios are more likely to expose banks to higher risks and trigger them to increase capital ratios as a buffer to withstand potential bank failure. The work of Ahmad et al. (2008) highlighted that a bank engaging with higher risk-taking behavior prefers to increase capital ratios.

Moreover, Table 3 shows that the increases in domestic risks and country-level governance are associated with higher capital ratios. This is in line with prior studies (Ayuso, Pérez, & Saurina, 2004; Jokipii & Milne, 2008; Stolz & Wedow, 2005), and implies that higher a country’s vulnerability triggers Islamic banks to increase capital ratios as a buffer to minimize unexpected losses. Results also support the study by Bitar and Tarazi (2019), which found that the stronger country-level governance corresponds with higher capital ratios, and Islamic banks in the presence of a strong institutional environment are more capable of raising equity than debt.

Table 4 and Table 5 present the impacts of governance dimensions and domestic risk sub-indices on capital ratios. Results of panel (A) support the study by Bitar et al. (2018) that shows how the improvements in corruption, political stability, government effectiveness, and legal systems within a country correspond with higher capital ratios. Likewise, the results of the panel (B) are in line with prior studies (e.g., (Cohen & Scatigna, 2016; Francis & Osborne, 2010; Kalifa & Bektaş, 2018)) and show that banks’ capital ratios increase with the rise of financial and economic risks. However, results indicate that decreasing political risk is also linked with higher capital ratios.

Table 4. The impacts of governance dimensions and domestic risk sub-indices on capital adequacy ratio.

Model 1: Capital adequacy ratio						
Panel (A): Governance dimensions scores						
Independent variables	Corruption	Government effectiveness	Political stability	Regulatory quality	Rule of Law	Voice and accountability
Lag capital adequacy	0.823* (4.89)	0.829* (3.11)	0.816* (4.12)	0.848** (2.08)	0.826* (3.12)	0.802* (3.18)
Governance score	1.562** (2.00)	1.002 (0.72)	2.589* (3.60)	3.570* (2.70)	1.386* (3.55)	1.802** (2.04)
Domestic risk	-0.230 (-0.94)	-0.349* (-5.69)	-1.475** (-2.07)	-0.836 (-0.81)	-1.266 (-0.75)	-0.624 (-0.58)
Bank-specific	Yes	Yes	Yes	Yes	Yes	Yes
AR(2)	0.368	0.353	0.389	0.393	0.370	0.426
Hansen test	0.354	0.388	0.375	0.525	0.543	0.361
Panel (B): Domestic risk sub-indices scores						
Independent variables	Financial risk index		Economic risk index		Political risk index	
Lag capital adequacy	0.769* (4.49)		0.834* (5.71)		0.664* (3.34)	
Governance score	1.346* (3.41)		1.184** (2.06)		2.159* (4.71)	
Domestic risk	-0.096** (-2.02)		-0.057* (-3.90)		0.649* (3.75)	
Bank-specific	Yes		Yes		Yes	
AR (2)	0.315		0.380		0.688	
Hansen test	0.419		0.399		0.498	

Note: Table 4 shows the effects of governance dimensions (Panel A) and domestic risk sub-indices (Panel B) on capital adequacy ratio. The symbols * and ** indicate statistical significance at the 1% and 5% levels, respectively.

Table 5. The impacts of governance dimensions and domestic risk sub-indices on total equity to assets.

Model 2: Total equity to assets						
Panel (A): Governance dimensions scores						
Independent variables	Corruption	Government effectiveness	Political stability	Regulatory quality	Rule of law	Voice and accountability
Lag equity to assets	0.140* (3.38)	0.138* (3.13)	0.146** (2.04)	0.127* (4.46)	0.131* (3.19)	0.137** (2.06)
Governance score	0.998*** (1.79)	0.422** (2.01)	0.824* (2.67)	0.995 (0.65)	1.050*** (1.67)	0.615 (0.80)
Domestic risk	-0.080* (-5.48)	-0.032*** (-1.67)	-0.067 (-0.62)	-0.081 (-0.28)	-0.077* (-4.84)	-0.074 (-0.68)
Bank-specific	Yes	Yes	Yes	Yes	Yes	Yes
AR(2)	0.430	0.426	0.355	0.367	0.315	0.352
Hansen test	0.695	0.485	0.556	0.441	0.489	0.625
Panel (B): Domestic risk sub-indices scores						
Independent variables	Financial risk index		Economic risk index		Political risk index	
Lag equity to assets	0.169*** (1.80)		0.132* (4.42)		0.125** (2.04)	
Governance score	0.951* (4.81)		0.782* (6.56)		0.353 (1.26)	
Domestic risk	-0.038* (-2.80)		-0.040* (-3.64)		0.082* (3.75)	
Bank-specific	Yes		Yes		Yes	
AR(2)	0.365		0.581		0.553	
Hansen test	0.443		0.372		0.428	

Note: Table 5 shows the effects of governance dimensions (Panel A) and domestic risk sub-indices (Panel B) on total equity to assets. The symbols *, **, and *** indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

4. CONCLUSIONS

Although several studies have investigated the determinants of Islamic bank capital ratios, few studies found to examine the dynamic effect of environmental characteristics on Islamic bank capital ratios. This study fills the research gap by examining comparatively the impact of country-level governance quality and domestic risk on capital decisions of Islamic banks operating in Arab markets by performing the System-GMM dynamic panel technique.

The results underscore that stronger country-level governance is linked with higher capital ratios, and banks can increase capital, particularly by improving corruption, political stability, government effectiveness, and legal systems. Results also reveal that banks' capital ratios increase with the rise of a country's vulnerability, specifically in response to rises in financial and economic risks. However, the results show that decreasing political risks also corresponds with higher capital ratios. Overall, the results confirm that environmental characteristics have a pivotal role in setting Islamic bank capital ratios. The results are robust, and the findings of this study are likely to open up new channels in the banking literature. Also, the results have significant implications and suggest to policymakers to prepare for a more financially and economically stable environment, which helps banks to reduce capital buffers and allocate their capital more effectively. Also, the results imply that regulators enhance country-level governance quality specifically by reforming new policies to control risk at both the bank and country levels. Although this study provides strong empirical findings for the Arab markets, further studies can contribute to the research by considering the corporate governance factor and testing its effect on capital ratios of Islamic banks for individuals or groups of Islamic countries.

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